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(54) Food weighing scale with nutritional calculation

(57) A weighing scale includes a detachable computer console in the form of a keypad and an LCD screen, programmed to calculate the calorie and nutritional content of the food being weighed. The scale can also store and analyse this and other information (keyed via the keypad) which can be used to provide nutritional guidelines for the individuals using it and whose details are also stored in the scale memory. New food recipes can be added to the memory. The scale can be linked to a PC and/or printer. Audible warnings on food intake may be produced, and dietary advice given.

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SCALES

This invention relates to scales which can be used as an aid to healthy eating and dieting.

Considerable number of people in the UK as well as other western countries suffer from obesity. The diet industry is one of the fastest growing.

Even apart from dieting, many people recognise that modern diet, often based on the so called fast food, often lacks vitamins and the right nutrients, while containing large amounts of additives and chemicals. Living in modern urban environment also means having to cope with increased pollution, which results in additional needs for vitamin and nutrition supplements which in the past have not been necessary.

While considerable amount of literature and computer software exists which contains data on caloric and nutritional values of foods, these are of little help to persons who are interested in improving their diet but have no time to study nutrition in detail and have no time to daily analyse all their food intake using assorted charts, tables and calculators.

The existing aids to dieting usually take the form of a computer software or a textbook.

The use of a computer software by definition requires access to a computer, the use of which is generally remote from the eating/cooking environment and generally as a whole too complex and expensive for an average dieter. If all an individual is looking for is a simple aid to healthy eating, the purchase of a computer to enable him to do this does not sound attractive. Even notebook computers would generally be too bulky and too expensive to provide a convenient way of tracking one's nutrition intake. Even where an individual in question already possesses a personal computer, he or she would still need to spend a considerable amount of time in front of it, which at best would be inconvenient.

An alternative to a computer software is to keep paper records in the form of charts and tables (indeed even with a computer software there will often be a need to keep your own records on the computer-generated forms) which require completing and then manual analysis,

which is likely to be time consuming and, by definition, prone to inaccuracy.

According to the present invention there is provided a scale, which will electronically calculate the nutritional value and calorie content of any portion of food either placed on the weighing part of the scale or input via a keypad into the computer programme of the scale.

The scale will take the form of plastic moulded box (made by using known technology) inside which there will be a computer chip or/and a hard disk with memory chips if necessary.

In one embodiment of the scale it will take the form of a box on top of which there will be included a flat surface on which a plate or other container can be placed containing food and the scale will then act as a weighing mechanism. The box will consist of two joined together parts, one forming a keypad and the other a small built-in LCD screen or a monitor. In effect it will be a form of electronic scales combined with computerised input/readout. In size the scale would be similar to an average kitchen scale or a food processor available on the market.

A particular benefit achieved by the present design is that it can neatly fit into a kitchen environment, without the need for large amount of space which would normally be required for a computer, although, as explained below, in a particular embodiment of the scale, it will be possible to link it with a desktop or other computer and /or computer printer for increased/ improved performance and to enable printed records to be kept if desired.

In another embodiment the scale will include a detachable two part console, which can be removed from the scale and used separately. The console in this embodiment will resemble a notebook when folded, unfolding to reveal a keypad faced by an LCD screen or monitor. A particular benefit of this embodiment is that it can be carried by a person in a briefcase or a handbag and therefore used outside the house to store information for future use.

In all embodiments the scale will include a keypad for keying the information and a screen which will display information. This would be

developed based on known technology for LCD or other systems known in computer or TV monitors.

The computer programme will include the following component parts performing the following functions:

1. A database of a variety of foods and food ingredients, each broken down into nutritional and caloric values per gram/ounce. Known technology will be used to apply the database to the chosen ingredient/foodstuff which is either being weighed on the scale and/or the information about which has been keyed into the computer. This is similar to the technology used in scales used in supermarket checkouts which produce prices of foodstuffs per unit of weight.
2. The program will produce the caloric values and nutritional (fat, cholesterol, carbohydrates, protein, fibre, vitamins and minerals) breakdown of the food with the information displayed on the screen. There will be facility to save the displayed information in the computer memory. In one preferred embodiment of the invention there will be a link to a computer printer so that the information can be retrieved in a printed form or the information can be recalled at any time (e.g. at the end of a day, week, month or year) to see exactly what an individual's calorie, vitamin or other nutritional composition was for any specified period. In a particular embodiment the scale will incorporate a printing mechanism including a till roll to enable a quick printout of the information to be obtained directly from the scale.
3. The program will allow to input personalised choice of selected foods, e.g. food preparations made frequently at home by the user of the scale so that there will be no need each time to key all the separate ingredients. There will be facility to add new food preparations to the database and save that information for future use. The computer will work out the calorie/nutritional content of the dish based on the input ingredients and their weight.
4. A database of personal details of up to a specified number of individuals, e.g. all members of a family. This would include personal information such as age, sex, name, height and weight, built, average physical activity levels, details of a particular diet to be followed(e.g.

normal, reducing, diabetic, high energy etc.) and known allergies. This information will be keyed into the computer and saved. There will be facility to update as necessary.

5. The database will include model daily/ weekly/ monthly/yearly etc. nutritional and calorie requirements depending on certain characteristics of a particular individual and specific diet requirements. It will also include data to enable particular levels of calorie intake to be linked with weight gain /loss as appropriate.

6. The database will also include the details of known food additives , including safe doses of each so that warnings can be given where too much of any particular additive can be detected when analysing the daily/weekly etc. intake of particular foods for a particular individual whose records are being analysed.

7. The program will give facility to :

- (i) give instant information on the nutritional and caloric values of the food portion in question
- (ii) store that information in memory for any of the recorded personalised data section kept in the memory.
- (iii) apply the given information against personal record of the individual concerned and where appropriate give warnings, e.g. about higher or lower than advisable calorie content or content of any particular element, e.g. fat, sugar etc. A warning would also be given in the form of a predicted weight loss/gain over a period of time (e.g. week, month or a year) if present intake is continued.
- (iv) produce daily/ weekly/ monthly/yearly etc. calorie/nutritional summaries for each individual recorded in the memory. This would include the totals consumed over a given period, comparison with the "model" requirements and , where appropriate, recommendations for additional dietary intake of certain nutrients , vitamins and minerals or for a reduction, e.g. in fat or carbohydrates intake. Recommendations may also be given on calorie intake in order to achieve set weight goals over a period of time.

In another embodiment of the scale there will be added to the scale a device which will be able to read bar codes or similar information provided in the form of a magnetic strip which may be provided on the

food packaging by the food manufacturers as and when nutritional information of the kind mentioned above is provided by the manufacturers in such form.

A particular benefit of the weighing part of the scale is that instant and accurate nutritional breakdown can be obtained when preparing food thus allowing for improvements to be made before a menu is finalised. Of course the scale could also simply be used for weighing items.

The user of the scale will be able to choose any one of the following options;

- weigh and display only;
- provide breakdown of caloric/nutritional values of the food on the scale (subject to the input of the type of the food);
- analyse or analyse and record the food's content in any of the personalised sections recorded for the specified individuals
- add new foods to database
- add / amend personalised sections
- provide daily/weekly/monthly/yearly etc. analysis and report on nutritional intake of any of the specific individuals
- provide dietary recommendations based on the analysis of nutritional intake for any of the specific individuals.

The benefit of the analytical part of the scale is that accurate records and forecasts can be made for a number of individuals in different circumstances, thus creating personalised records and analysis of diet which should lead to diet improvements.

CLAIMS

- 1. A scale comprising a weighing element with a built-in computerised console in the form of a keypad and LCD screen or monitor which incorporates a computer programme designed to calculate and analyse nutritional values of the food item being weighed.**
- 2. A scale according to claim 1 characterised in that the computerised console is detachable and can be used separately from the scale.**
- 3. A scale according to claim 1 characterised in that it includes a flat surface on which a plate or other container can be placed containing food while details of the food and other particulars can be keyed into the scale by means of the keypad.**
- 4. A scale according to claim 3 characterised in that a plate or other receptacle can be placed upon it and the scale's readout returned to zero so that only the weight of the food placed on it is recorded.**
- 5. A scale according to claim 1 characterised in that personal details of a number of individuals can be keyed into it, including name, sex, age, height and weight, built, average physical activity level, details of a particular diet and known allergies.**
- 6. A scale according to claim 1 characterised in that it will include a database of nutritional information (including calorie, fat, cholesterol, carbohydrates, protein, fibre, vitamin and known mineral content) on a number of foods which it will be able to apply to the food being weighed and the details of which have been keyed in according to claim 3.**
- 7. A scale according to claim 6 characterised in that it will be possible to expand that database of foods by an addition of new food preparations based on a combination of other foods already on the database with the caloric and nutritional content of the added foods being calculated automatically.**

8. A scale according to claim 6 characterised in that the database will include details of known food additives including safe doses of each so that it will provide a warning if an excessive dose is detected.
9. A scale according to claim 1 characterised in that it will include a database of model daily, weekly, monthly etc. nutritional and caloric requirements depending on certain characteristics of a particular individual and specific diet requirements.
10. A scale according to claims 1, 3, 5 and 6 characterised in that it will provide an instant analysis of the nutritional and caloric values of the food being weighed with the user being able to read the result on the LCD screen or monitor forming a part of the scale.
11. A scale according to claim 10 characterised in that it will analyse the particular food by reference to the personal data of the individuals recorded according to claim 5 and identify appropriate/ inappropriate ingredient, giving the result on the LCD screen or monitor.
12. A scale according to claim 11 characterised in that it will produce, on request, periodical (e.g. daily, weekly, monthly/yearly etc.) analysis of all the food intake of a particular individual over the given period of time, a summary of which will be available for the user to see on the LCD screen or monitor.
13. A scale according to claims 9 and 12 which will compare the results of the individual analysis with the model requirements and indicate any deficiencies or excesses.
14. A scale according to claim 1 which will include a detachable link by way of cable with a personal computer and/ or a computer printer whereby information can be transferred to a PC and / or printed for the record.
15. A scale according to claim 1 characterised in that it will have limited self-printing facilities including a device similar to a till roll, thus eliminating the need for a computer or printer for minor printouts.

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silver 1, 2
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16. A scale according to claims 1,5,6 and 13 characterised in that it can be pre-programmed so that on any particular food being weighed in respect of any particular individual kept on its database a warning will be given in the form of a buzzer or a bell of any "forbidden" foods or excesses that are about to be consumed by that individual, for example someone suffering from diabetes or known allergies recorded .

17. A scale according to claim 16 characterised in that by comparing the food being weighed with a record of any individual on its database it can warn an individual that he or she is consuming too much or too few calories.

18. A scale according to claim 17 characterised in that after a week's/month's/ year's input it will be able to predict future (e.g. over a period of week/month/year etc.) weight loss or gain for the particular individual if the present dietary intake is continued.

19. A scale according to claim 18 characterised in that it will be able to give recommendations on necessary nutritional and dietary supplements in order to safely reduce weight.

20. A scale according to claims 1, 5,6 and 11 characterised in that following an analysis of food intake for a specified individual it will be able to advise on what food should be eaten to replace a vitamin or nutritional deficiency.

21. A scale according to claims 1,5, 6 ,11 and 18 characterised in that it will calculate an individual's daily intake of calories and make a recommendation as to the future daily calorie intake in order to reach desired weight by a certain date in the future.

22. A scale according to claim 1 characterised in that it will incorporate a device, made using known technology, which will be able to read information from magnetic strips such as bar codes incorporated on the food packaging provided by the manufacturers.



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Claims searched: 1 - 22

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Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): GIW WL

Int Cl (Ed.6): G01G 19/413 19/414 19/415

Other: ONLINE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2296780A FOOK TIN - FIG 1	1,6,10
X	GB 2269021A NEUTRON - FIGS 3,5	1,3,4,6,10
X	GB 2229541A WALSH - FIG 1	1,6,10
X	GB 2133166A PALMER - Whole document	1,6,9,10
X	GB 2046926A APAG - THE FIG	1,3,6,15
X	WO 95/01553 HAMM - FIGS 1 - 3	1,3,6
X	US 5233520 KRETSCH/ SEC. of AG. - ALL FIGS	1,6,22
X	US 5033561 HETTINGER - FIGS 1,4	1,3,6,10, 12,13
X	US 4911256 ATTIKIOUZEL/ SENTRON - FIG 1	1,3,4,6,10

X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.

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A Document indicating technological background and/or state of the art.
P Document published on or after the declared priority date but before the filing date of this invention.

E Patent document published on or after, but with priority date earlier than, the filing date of this application.